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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DIRK JACOB and TOBIAS ORTMAIER

Appeal 2015-001891[1,2]
Application 13/060,847
Technology Center 3600

Before PHILIP J. HOFFMANN, JAMES A. WORTH, and CYNTHIA L. MURPHY, *Administrative Patent Judges*.

HOFFMANN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 11–21. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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[1] Our decision references Appellants' Appeal Brief ("Appeal Br.," filed Mar. 20, 2014) and Reply Brief ("Reply Br.," filed Aug. 6, 2014), as well as the Final Office Action ("Final Action," mailed Oct. 22, 2013) and the Examiner's Answer ("Answer," mailed June 4, 2014).

[2] According to Appellants, KUKA Laboratories GmbH is the real party in interest. Appeal Br. 3.

Claims 11 and 18 are the only independent claims. *See* Appeal Br., Claims App. We reproduce claim 11, below, as representative of the appealed claims.

> 11. A method of controlling a robot having at least one robot arm, the method comprising:
>
> detecting with a non-contact distance sensor a first movement of an object;
>
> wherein the non-contact distance sensor is attached to at least one of the robot arm or an end effector attached to the robot arm;
>
> moving the robot arm on the basis of the detected first movement in a manner that prevents collision between the robot arm and the object; and
>
> maintaining the position and orientation of an attaching device of the robot arm or of a tool center point of the end effector while moving the robot arm in the manner that prevents collision.

Id.

REJECTIONS AND PRIOR ART[3]

The Examiner rejects claims 11–14, 18, and 19 under 35 U.S.C. § 103(a) as unpatentable over Komainda and Hiller, *Control of Heavy Load Manipulators in Varying Environments*, XVI AUTOMATION AND ROBOTICS IN CONSTR. 301–306 (1999) (hereinafter "Komainda"), and Nanayakkara et al., *Skillful Adaptation of a 7-DOF Manipulator to Avoid Moving Obstacles in a Teleoperated Force Control Task*, IEEE 1982–1987 (2001) (hereinafter "Nanayakkara").

[3] The Examiner withdraws a previous indefiniteness rejection. *See* Final Action 2–3; *see* Answer 2.

The Examiner rejects claims 15, 16, and 20 under 35 U.S.C. § 103(a) as unpatentable over Komainda, Nanayakkara, and Merte (US 2008/0021597 A1, pub. Jan. 24, 2008).

The Examiner rejects claims 17 and 21 under 35 U.S.C. § 103(a) as unpatentable over Komainda, Nanayakkara, and McGee (US 2002/0188379 A1, pub. Dec. 12, 2002).

See Final Action 3–9; *see* Answer 2.

ANALYSIS

Independent claim 11 recites, among other features, "maintaining the position and orientation . . . of a tool center point . . . while moving the robot arm in the manner that prevents collision." Appeal Br., Claims App. Appellants argue that the rejection is in error because the Examiner's proposed combination of references fails to disclose this feature. *See* Appeal Br. 6–10; *see also* Reply Br. 2–5. Based on our review of the record, for the reasons set forth below, we agree with Appellants. Thus, we do not sustain the rejection of claim 11.

As described in Komainda, "[i]n order to be able to avoid collisions with unexpected and moving obstacles, an intelligent control concept is required which combines the off-line planned paths with on-line sensor information." Komainda, Abstract. Komainda further describes control that provides for "reconfiguration of the boom, where the position and orientation of the [tool center point] is not changed." *Id.*, Section 2.1. Thus, we agree with Appellants that the cited portion of Komainda does not disclose that a tool center point remains in a same position and orientation *when the arm is moving to prevent a collision*, as opposed to maintaining the

tool center point position and orientation during some other procedure. *See, e.g.*, Appeal Br. 8–9.

In the Answer, the Examiner states that Komainda is not relied upon to teach that the tool center point remains in the same position and orientation *when the arm is moving to prevent a collision*. *See* Answer 4. Rather, the Examiner finds that Nanayakkara teaches "avoiding obstacles when [the system] detects an incoming obstacle, where avoiding is the same as moving the robot to prevent collision," and that based on Nanayakkara's teaching, it would have been obvious to combine the references to provide a method of controlling a robot that maintains the position and orientation of the tool center point while moving the robot arm in a manner that prevents collision. *Id.* The Examiner's finding regarding Nanayakkara's teaching is reasonable and supported by substantial evidence. But, inasmuch as neither reference appears to disclose maintaining a position and orientation of a tool center point *while moving a robot arm in the manner that prevents collision*, we determine that the combination of Komainda (which discloses both movement to avoid a collision as well as maintaining a position and orientation of a tool center point, but does not disclose maintaining the position and orientation of the tool center point while moving to avoid the collision) with Nanayakkara (on which the Examiner relies to teach movement to avoid a collision) does not reasonably suggest the claim limitation under discussion.

Based on the foregoing, we do not sustain the rejection of claim 11. We also do not sustain the rejection of independent claim 18, which recites a similar limitation. Still further, we do not sustain either of the rejections of claims 12–17 or 19–21 that depend from claims 11 and 18, as the Examiner

does not rely on any other reference to remedy the deficiency in the rejection of the independent claims.

DECISION

We REVERSE the Examiner's obviousness rejections of claims 11–21.

REVERSED